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Tire Safe, LLC Division

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DEPT OF TRANSPORTATION

01/01/00 - 3 PM 1:19

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Applications That Make Sense: Economy - Safety - Environment

November 1, 2000

To Whom It May Concern:

NHTSA-00-8572-1

Re: **Portable Tire Temperature and Pressure Monitor.**

Sensatec, LLC has developed and patented **Tire Safe** the *Tire Sentinel* - an extremely reliable "dynamic tire pressure & temperature sensor" system developed specifically for the transportation industry for vehicles with 2 to 72 tires.

Tire Safe alerts drivers to impending tire, bearing and brake problems well ahead of any potential damage to the tire, vehicle, payload, or passengers.

Tire Safe drastically reduces costly road repairs and other tire-related delays by generating both an aural, visual and digital alert upon any increase in tire temperature or decrease in tire pressure. It **provides constant monitoring of changes** in tire pressure and temperature on any vehicle - even airplanes.

Tire Safe promotes safety, reduces tire wear, increases fuel economy, provides advanced warning of potential tire problems, may eliminate blowouts and is extremely simple to install. The unit's potential in weight measurement should provide truck operators additional value by displaying incorrect load balance, total weight and weight changes on subsequent loading or offloading. **Tire Safe** improves mileage and enhances road safety by accurately indicating tire pressure and it can be coupled to a satellite transmitter to relay information to a central control facility.

Tire Safe is so easy to install that it can easily be transferred from one vehicle to another. It takes only 3 minutes to install on a 4-wheeled vehicle, 10 minutes for a bus and just 15 minutes for a tractor-trailer. No tools are required and no tires need be removed. The unit is extremely easy and economical to operate. The only maintenance required is replacement of each sensor's hearing aid battery every 12 to 24 months, depending upon usage.

DOT statistics indicate that improperly inflated tires cost millions of dollars annually in tire wear, reduced mileage and excessive fuel cost.

No product compares with **Tire Safe's** reliability, value, ease of installation and low maintenance.

Our website: sensatecllc.com demonstrates **Tire Safe**. Sensatec has several inventions that enhance transportation economy and safety and we are presently seeking distributors, test operators and financing for the manufacture of our products. Please contact me at 914-477-0200 or fax to 914-477-0295.

Sincerely,

James Moore

TIRESAFE PRODUCT OVERVIEW

TireSafe, LLC
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Greenwood Lake, New York 10925
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CONFIDENTIAL
PRIVATE PLACEMENT MEMORANDUM

December 27, 2000

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TIRESAFE OVERVIEW

TireSafe, LLC, of Greenwood Lake, New York, a subsidiary of *Sensatec*, LLC, of Middletown, New York has developed a very interesting concept to enhance the safety, efficiency and reliability of motor vehicles by monitoring one very important vehicle component - tires! Our first product, *TireSafe*, is a patented two-way wireless tire-monitoring system that measures pressure and temperature. This easily-installed system allows a vehicle operator to see at a glance the conditions of each tire. If any tire is out of range or undergoing a change in temperature or pressure, a user-friendly audible and visible warning/alarm indications will activate. The Company is also developing weight-measurement and balance detecting features that we hope to incorporate in *TireSafe*. The benefits of using *TireSafe* include:

- lower operating costs,
- increased gas mileage,
- enhanced safety,
- lower environmental degradation,
-
- lower tire maintenance and services costs, and
- early warning of heat-related or other brake problems.

The Company has successfully completed the first prototype phase and patenting process. The second phase will focus on final product development, beta testing, production, packaging, marketing and additional software developments.

The *TireSafe* prototype is designed to be used on many types of vehicles including the passenger car, SUV and the Class 8 vehicle market that, estimated at five million trucks, includes 14 and 18 wheel tractor trailers. *TireSafe* is easily applied to most other vehicles that use tires, including passenger cars, limousines, light duty pickup trucks, trailer trucks, motorcycles, buses, off-road heavy equipment, recreation vehicles, aircraft, auto racing, bicycles and even rafts.

The commercial trucking market is quickly striving for increased efficiencies as several trends have recently emerged including fluctuating fuel prices, increased competition, just-in-time manufacturing, congressionally-proposed reduction in driver hours, and critical driver shortages. The SUV market is a prime opportunity for our company with the recent developments of the failing Firestone/Bridgestone and Goodyear tires. These failure are centered around tread separation due to heat in the tires. The damaging heat is caused by too low, or even too high tire air pressure. By using our *TireSafe* tire monitoring system to help drivers keep safe tire pressure, failures of this nature would be statistically eliminated.

The Concept

TireSafe emanated from the understanding that since tires are the only item of an automobile in contact with the road, tire management can have significant effect on safety, ride comfort, fuel economy and handling. Research has shown that very few products adequately measure tire pressure without operator intervention. Further, the tire monitoring systems that were on the market had very low name recognition, in part because of several limitations of their designs.

The trucking industry addresses their tire pressure issues in less than ideal ways, including using a baseball bat to tap each tire to roughly determine each tires pressure status. While better than no attention, demonstrations have shown that tire pressures could vary by 20 - 30 pounds, or more, and still pass the baseball bat test. By using *TireSafe*, the transportation industry is poised to make profound change in its tire maintenance programs. Now, a driver simply has to look at his dashboard display unit to quickly and accurately see the tire pressure and temperature of each tire on his vehicle.

THE PRODUCT

Description

TireSafe is a patented user-installed, portable, tire-monitoring system for any tire-equipped vehicle. Its primary components include sensors on each tire valve and portable dash unit. *TireSafe's* wireless system measures both pressure and temperature, includes a screw on sensor unit that is easily installed to each tire's valve stem with no tools. The portable dash unit (PDU) consists of a liquid-crystal display or LCD, screen that can be mounted in a variety of locations, using Velcro or visor clips, or can be used as a handheld device for accurate refilling of tires. The PDU, power options include battery-powered, wired, or cigarette lighter plug-in. *TireSafe* also provides a quality-of-ride feature that integrates pressures from all tires to display how a

vehicle is riding. *TireSafe*'s valve sensors are externally mounted, and designed to withstand the environment and tire rotation. The sensor will fit most types of wheels, and has the flexibility to be transferred to other types of vehicles such as autos, buses, motorcycles, and racing cars.

The tire sensor, a one inch by two inch cylinder, is equipped with a special universal-mounting sleeve which will allow it to fit on most wheel-types including 18-wheel trucks, tractor trailers, buses, automobiles, sport utility vehicles, motorcycles, airplanes and racing cars. Additionally, the battery-powered sensors employ power-conserving techniques to maximize battery life. The anticipated battery life is 9 to 24 months depending on battery type, frequency of interrogation, and amount of use.

The system can be easily programmed through the PDU setup buttons. The customer will have the flexibility to accept factory default conditions thus requiring no programming, or have the capability to program a variety of performance monitoring features. Some of these features include variable pressure, temperature, frequency of readings (sensor battery life), and alarm settings. The operator can set the level at which the tire pressure and temperature measurements will activate the audible and visual warning and alarm features. The unit can also be programmed to extend sensor battery life. The PDU display includes a liquid crystal display (LCD) for measurements and messages, and a series of tri color LEDs that continuously display each tire's position and its condition. Green is normal, amber is a warning condition, and red is an alarm condition.

Other PDU functions include buttons for power and setup menus, an optional computer connection for downloading of tire condition history. By using this connection, fleet customers will be better able to minimize operational expenses through effective tire management using current software programs, or *TireSafe*'s tire management software. Additionally, *TireSafe* is presently exploring an enhancement for measuring payload and weight/balance that we expect to incorporate in advanced versions, which will be especially useful for the heavy trucking and construction equipment sectors.

Operation

TireSafe's tire monitoring system utilizes radio frequency (RF) that begins with an initial query by the dash unit to each tire sensor to determine sensor readiness and location with unique identification numbers. Upon a ready condition, each sensor takes on a low-power mode until the dash unit requests measurement information from that sensor. This increases sensor battery life. If a sensor is not ready, the display unit alerts the operator and offers remedial suggestions, then moves on to the next sensor. Sensors report to the dash unit upon interrogation in either a sequential pattern, or independently when there is a significant change in the tire's parameters. The alphanumeric display and LED indicators display their appropriate status. If a warning or alarm condition occurs, an internal beeper will sound, and the appropriate LED will flash thus alerting the vehicle operator. This condition will also trigger constant monitoring of the particular tire in question. (See table below.)

Truck Tire Pressure Indicators			
	Normal 100-110 psi*	Warning 90-99, 111-115 psi*	Alarm <89, >115 psi*
Audible	None	Low intermittent tone**	High persistent tone**
Visual LED color	Green	Amber	Red
Visual LED flash rate	None	Slow	Fast

* User selectable ranges.

** May be disabled by operator.

Specifications

System

- Patented.
- Indicates individual tire pressure and internal tire temperature.
- Indicates individual sensor battery condition.
- Indication of quality of ride.
- Optional security feature triggered by the unauthorized removal of a sensor.
- Optional communication control relay box for trailers that allows a single truck to connect to any *TireSafe* equipped trailer.
- Communication frequency is 900-950 Mhz range.

Dash Unit

- Computer connection for downloading of tire history log (optional).
- PDU power options include hard wired, battery, or cigarette-lighter plug-in.
- Air fill feature allows removal of the PDU to monitor air pressure during the filling process.
- Multiple alarm/warning levels for both audible and visual indication.

Sensor Unit

- Safety breakaway feature of the sensor ensures against accidental loss of pressure if sensor is damaged.
- Sensor theft deterrence by manufacturing individual electronic identification numbers in each sensor.
- Special sleeves allow sensors to fit most valve stem arrangements.

Benefits of TireSafe

- Virtually eliminates breakdowns due to tire failures.
- Reduce breakdowns due to bad brakes.
- Limited detection of overheating brakes.
- No tools are needed to install the sensors, or the PDU.
- Reduces fuel consumption.

- Reduces operating costs.
- Increases payload delivery reliability.

INDUSTRY TRENDS

The commercial transportation industry will embrace the *TireSafe* system as it conveniently addresses several important issues. Actual driver time is at a premium now, and is expected to heighten with continuing critical driver shortages and the hours-of-service regulation proposed by The Department of Transportation (DOT.) The National Highway Transportation Safety Administration (NHTSA) views properly maintained tires critical to highway safety. They note that half of all vehicles have at least one tire that is under inflated which often goes undetected. The problems occurring from improper inflation result in unsafe driving conditions due to premature tire wear and reduced handling. Other problems include inefficient fuel economy and environmental degradation including more tires in landfills. Further, while the economy continues to flourish, the trucking industry is taking in record revenues, however, their overall profit margins are just 4%. Customers using *TireSafe's* tire monitoring systems will increase safety, lower operating costs, and help stem driver shortage issues.

Legislation

The DOT is sponsoring legislation to reduce the number of driving hours during the day and workweek for truck drivers. DOT's lead agency, the Federal Motor Carriers Safety Administration (FMCSA) has recently been established to significantly increase highway safety in the commercial transportation sector. The proposed hours legislation will cost the industry \$3.5 billion to implement according to FMCSA. However, the transportation sector believes the estimate may be closer to \$130 billion. Either way, the transportation industry and its customers will share in the higher operating costs. In legislative hearings held in July, 2000, several large trucking companies including Schneider National, Con-Way Transportation Services, Consolidated Freighters, Inc., and Crete Carrier Corporation, voiced their concerns over the DOT's impending legislation. Some of these issues include estimates of a 20 - 25% increase in trucking company operating budgets, thousands of new tractors, trailers, and drivers, and up to a 30% decrease in driver earnings all due to the decreased number of hours for drivers. Trucking concerns can help offset these losses by implementing *TireSafe*. Additional legislation has mandated that all new 4-wheel vehicles will be required to be equipped with a tire pressure measuring device by 2003. (See *TireSafety Legislation* below.)

Driver Shortages

The commercial transportation industry has been facing a critical driver shortage, largely due to the robust economy that lures potential candidates to other higher paying positions. Accordingly, trucking firms are enticing the best drivers, further contributing to the very high job turnover rates. Some companies are experiencing 25 to 100% turnover rates. One of the factors that prospective drivers consider is the reliability of the trucks they will drive since they are usually paid by the mile. Tires are an important element regarding reliability. Poorly maintained tires result in premature wear, flats, and worse yet, blowouts. Effective tire

maintenance is looming more important than ever before in order to keep and attract the best talent. Increased reliability will also allow drivers to operate more safely and still spend more time at home.

Tire Recalls

Recently, Firestone/Bridgestone and Goodyear have been in the news spotlight centering around the massive tire recall due to tread separation. These tires have failed primarily in SUV's and pick-up trucks, resulting in many injuries and well over 200 deaths. Both Ford and Firestone/Bridgestone have attributed the defects due to the manufacturing process and improper inflation. Much concern exists with Ford recommending to SUV owners of these tires to lower the air pressure beyond safe operating limits. The tire flexing, and increased friction causes heat buildup of the tire, especially causing the bonding agents between the tread, steel belt and carcass to deteriorate over time, resulting in the tread violently separating from the tire. By using *TireSafe*, drivers can better monitor their tire pressure and observe temperature abnormalities that will result in less tire blowouts.

Tire Safety Legislation

On November 2, 2000, President Clinton signed into law the Transportation Recall Enhancement, Accountability, and Documentation (TREAD) Act, H.R. 5164, section 6. The legislation is in part responsive to the recent tire recall situation. The bill's expectations are to promote safer vehicle operation, better manage tire recalls, and to provide better reporting of vehicle defects. The bill includes that all new vehicles are required to have a tire monitoring system to warn of "significantly" low tire pressure in place by 2003. Additionally, the Act mandates "... public awareness of the importance of observing ... proper tire inflation levels." The bill further requires dynamic rollover tests of motor vehicles to incorporate into a consumer information program. **It is this public awareness that positions *TireSafe* as a market leader in providing dynamic tire information to drivers.**

SUV Owner Driving Habits

Sport utility vehicles, SUV's, are trucks that have many features of a car. They can navigate in many types of unusual terrain, travel at fast speeds, handle well, and are quiet and comfortable. These vehicles are very popular in part because of their flexibility. Many drivers set up the vehicles for off-road driving primarily by reducing tire pressure to gain better traction. These vehicles have a higher profile that aids in low-speed maneuverability. An SUV's unique value is its ability to work as a truck while it drives as a car. SUV drivers tend to drive similar to other automobiles drivers while on the highway.

With higher center of gravity, higher wind profile, higher loads, and tires designed for less than ideal terrain, an SUV driver can be lulled in to a false sense of security. A certain percentage of drivers speed including the SUV drivers. Between the high speed and disregard of their SUV as a truck, many accidents and deaths have occurred with the tires often being the likely culprit. By being able to easily monitor tire pressure, SUV drivers will be in a better position to maintain their pressures, especially when the pressures have been lowered to meet untoward driving conditions, and alerted to impending tire problems which could

be catastrophic. *TireSafe* will make the nation's highways safer.

MARKETING

Heavy Trucking

The United States Department of Transportation defines the heavy-truck class, as category 8 commercial vehicles weighing a minimum of 33,000 pounds. The category 8 class primarily consists of 14 and 18-wheel tractor trailer combinations, or "rigs". According to the American Trucking Association's (ATA) Statistics Group, there were 2.3 million trucks (truck is defined as the tractor and its trailer combination) in 1998, logging an average 48,000 miles each. Additionally, the ATA reports there were 4.4 million registered trailers. The total number of tires on these trucks and trailers is 62 million. Accordingly, the total United States market potential is \$4 billion with *TireSafe* anticipated selling price of \$1,200, or \$63 per tire. The ATA estimates that there are 79 million trucks of all types in the United States alone. Adding the rest of the world would seem to indicate an enormous market potential.

TireSafe will articulate selling points such as operating costs savings, reduced tire wear, lower fuel costs, enhanced safety, and environmental concerns due to longer lasting tires, and less fuel consumption. *TireSafe's* marketing strategy is to promote our system's reliability, ease of installation and use, accuracy, and portability.

Today, the trucking industry is experiencing elevated competition that increases pressure to keep the trucks on schedule more than ever. Improperly maintained tires can lead to several avoidable problems including increased tire wear, unsafe vehicles, and breakdowns. Recovery from roadside breakdowns due to tire failure is estimated between \$125 - \$1,000. Critical nation-wide driver shortages hampers scheduling resulting in driver and carrier alike to operate under unsafe procedures including speeding and driving too many hours. No business can afford customer ill will that is created by missed or delayed meetings or shipments that may result in those customers using the competition. *TireSafe's* tire monitoring system will allow drivers to keep their cars and trucks on the road more reliably

A typical customer for our product is a fleet operator or trucking concern that wishes to reduce operating costs through effective use of an accurate tire measurement system. Such a customer is aware of the effect of downtime and delayed delivery on company's profits and goodwill. As profit margins are so vitally important, commercial trucking companies will help offset operating costs by using our system. Our initial cost-benefit analysis show a vehicle that travels 48,000 miles per year and pays \$1.50 per gallon for fuel, will reduce operating costs by \$500 per year. For trucks that log 100,000 miles per year, the savings increases to \$650 per year. The analysis does not take into account driver turnover and training costs, or delayed or damaged payloads. Possibly more importantly, the carriers will realize higher reliability in on-time deliveries and consequently better service. *TireSafe* users will see immediate benefit with overall decreased operating costs.

Off-Road Equipment Machines

The off-road equipment industry is another market that will see significant benefit by using our system. Heavy equipment machines are relatively slow movers, so tire pressure may falsely be considered unimportant. Correct tire pressure is important to safety regarding handling and traction. These machines typically operate on less-than-ideal road surfaces such as mud, loose gravel, sand, etc. If the tires have unequal pressures, then one tire may grab better while the other simply spins in place because of poor traction resulting in excess tire wear on tires that can cost as much as \$35,000 each. Further, loads may shift resulting in the machine toppling over. Essentially, improper air pressure will only put an operator at risk. By using *TireSafe's* tire pressure monitoring system, companies will realize both economic and safety advantages.

Sport Utility Vehicles

TireSafe has recently started to address the SUV market because of its well publicized tire failures. Federal legislation has been passed in November, 2000 that requires automobile manufacturers to equip their vehicles with a tire pressure monitoring system by 2003 in addition to educating the public of the importance of correct tire pressure. Public awareness has already increased significantly regarding how tire pressure maintenance is important to safe driving. *TireSafe* is currently working on strategies to enter the SUV market as an original equipment manufacturer and as an after-market product.

Other Markets

TireSafe's goal is to sell its patented tire monitoring system to many segments of the transportation markets including commercial, personal, and leisure sectors. *TireSafe* has identified the following additional segments as consumers of the Company's tire monitoring systems:

- Personal transportation,
- Motorcycles,
- Auto racing,
- Aviation, buses,
- Miscellaneous (including inflatable rafts, and bicycles.)

COMPETITION

Recent entries in the tire pressure monitor market by Unicom Signal Inc. and its passenger car division Smartire, Fleet Specialties and PSI have not gained nation-wide recognition because of their inherent design limitations and cost. Estimates indicate that 99% of the United States market is untapped, primarily because these products present high initial costs, high installation costs, high maintenance costs, and limited display information. *TireSafe's* patented system has alleviated or eliminated some of these limitations. We fully expect that our product will initially be embraced by the fleet and heavy trucking industry followed by other markets including private automobiles, buses, construction vehicles, motorcycles, and race cars. Several companies with products under development have recently entered the marketplace. We feel that we are

competing with two primary companies: Unicom Signal Inc.'s commercial vehicle division, and Fleet Specialties.

Unicom Signal Inc.

Unicom Signal markets a tire pressure and monitoring system for tractor trailers that sells for approximately \$1400. It consists of internally-mounted wheel sensors and an on-board display that shows both pressure and temperature. They advertise sensor battery life of several years, largely because their location inside the wheel allows for larger batteries.

This system may compromise safety because wheel balance may be impaired and measurements are only taken every four to five minutes thus missing critical information on a fast leaking tire. Installation of the system can be very costly; perhaps \$500-\$700 per tractor trailer since each tire has to be broken down from its wheel. Finally, one must be well organized to keep track of when and how to replace sensors from one tire to the next. One deficiency of the Unicom System is the difficult installation of each sensor within the tire. The customer may choose the *TireSafe* system over Unicom Signal's because of our ease of installation and the ease of transfer of our sensors.

Smartire

Smartire sells several models for passenger cars from \$250-400. Much of the technology is similar to the Unicom systems, including the long battery life. The systems consist of internally-mounted wheel sensors and an on-board display that may display tire pressure and temperature depending on the model. The basic model alerts drivers of low tire pressure serving as an idiot light, while the deluxe version displays actual pressure and temperature of each tire.

Smartire has been featured on several television shows in recent months primarily because of its safety features in light of the recent Firestone/Bridgestone and Goodyear tire failures. Our research has shown several concerns. Purchasing of these systems, as recently as December, 2000 is an uncertain process. Upon contacting several distributors including Sears, we found that Smartire is not common place, available, nor understood regarding its installation. In fact, one facility on the East Coast discouraged the sale of a system to us because of its "... poor reliability." Further, the installation is rather involved since the tire has to be unmounted, the sensor strapped to the wheel, and the tire remounted without damaging the sensor unit. Smartire has several admirable features that deserve consumer attention, however, availability, reliability, and installation should be fully understood before a consumer can make the best choice.

TireSafe addresses Smartire shortcomings. Our system is easily installed, and easily transferrable to other vehicles. One of our primary aims is the perception and reality that *TireSafe* is synonymous with quality. We have constantly viewed quality and reliability as components that will pave the path for a long and successful venture. Initial testing has confirmed our system's reliability. *TireSafe* will be the more desired product.

Fleet Specialties

Fleet Specialties sells a tire monitoring system with battery-powered sensors which simply screw on the valve stems. While innovative, their devices do not display tire pressure; they only send warning signals when tire pressure drops to 90-95% of a predetermined tire pressure. They require the purchaser to send them their tire pressure requirements before ordering which is cumbersome and inflexible. Thus because each system is factory customized, it is not transferable to other vehicles. Additional systems must be purchased as a complete package. This forces cost conscious truck drivers to spend more than they would need to if they only wanted to monitor certain tires such as the steering, load, or trailer tires. Their pricing is fair if one is only looking for minimal functionality; \$795 to equip a tractor-trailer. If the customer is looking for performance such as actual displayed measurement, or system flexibility then Fleet Specialties does not meet the need at this time. *TireSafe* addresses Fleet Specialties design flaws.

PSI, Pressure Systems International

PSI manufactures an automatic tire inflation system available for approximately \$900 for trailers that uses the trailer's compressed air system to inflate any tire that falls below a pre-defined air pressure. The system fills the tires when the pressure falls 15 - 20 pounds below the preset level. While it addresses safety issues reasonably well, performance features that save tire life and increase fuel mileage is not part of the PSI system's design. The system works only when the air-brake system has sufficient air pressure (at least 80 psi) and when the vehicle is in motion. A one-way check valve located in the hose connected to each valve stem protects each tire against air pressure loss, although there have been reports of air leakage in idle tires. If a tire is punctured during operation and loses air pressure, the check valve prevents loss of pressure in the other tires. While the PSI system is attractive, it does have several issues that must be considered. There are no displays for the operator to observe actual pressure. Installation is involved and should be done by an experienced mechanic. The PSI system is not for the entire truck, but is designed to only be installed on trailer tires. The front wheels of the tractor are the most important of all from a safety point of view. There are maintenance issues such as checking the filter and calibration of the control box. *TireSafe* considers PSI as a secondary competitor, primarily because of its limited use for trailers, lack of performance, and lack of pressure and temperature.

***TireSafe* addresses the following limitations:**

High installation cost (internally or hub mounted wheel sensors.)

- Sensors are not transferable.
- Unreliable. operation
- Limited information display formats.
- Awkward and limited ordering process.
- Compromised safety because measurements are taken too seldom.

Tire Pressure Monitoring System Comparison for Class 8 Trucks, [over 33,000 pounds]				
	PSI	Fleet Specialties	Unicom Signal	TireSafe
Cost for system	\$900	\$700	\$1,400	\$1,200
Number of sensors, typical	8	18	18	20
Cost per sensor	\$112	\$38	\$77	\$60
Cost to install system @ \$50/hr.	\$300 [6 hours]	\$300 [6 hours]	\$500 [10 hours]	\$25 [.5 hours]
Total cost per system	\$1,200	\$1,000	\$1,900	\$1,225
Total cost per sensor	\$150	\$54	\$106	\$61.25
Wireless	No	400 Mhz	300 Mhz	900 Mhz
Sensor location	Axle and valve stems	Valve stem	Inside of tire	Valve stem
Display	None	Pressure	Pressure, temperature	Pressure, temperature
Other	Adjusts pressure	Monitor pressure	Monitor pressure and temperature	Monitor pressure and temperature
Transferability	No	No	No	To any tires of any vehicle

FINANCIAL MANAGEMENT

Required Investment

TireSafe has successfully completed the first phase of prototyping with the design, construction and testing of the first four sensor units and a dash unit. The second phase is underway for 20-40 units with a projected date of March, 2001. The major areas during this phase include: reduction of the sensor unit assemblies to final size, refinement of the communication software, and an improved antenna design. Following the prototype phases will be final design, construction, and beta-testing. The Company will then

be ready to manufacture its first production run.

Accordingly, our capital requirements over the next several months are \$2,000,000. At the completion of a successful test marketing phase and final product modifications, *TireSafe* expects to move to the manufacturing phase where the Company plans on our first full-scale production run of 10,000 - 50,000 systems. We believe that the ultimate retail over-the-counter price of this system for an 18 wheel tractor-trailer will be approximately \$800-\$1500, depending upon the manufacturing costs, and size of production runs. Systems for 4-wheel vehicles would likely sell from \$250-\$400.

Next Phase Capital Requirements

Description	Amount	
	1 st year	2 nd year
Costs to manufacture 200-600 systems	\$200,000 - \$300,000	
Costs to administer, monitor, and react to deployment	\$50,000 - \$125,000	
Salary and benefits for lead manager	\$100,000 - \$150,000	\$100,000-\$150,000
Salary and benefits for full time executive	\$40,000	\$50,000
Marketing/advertising	\$25,000 - \$50,000	
Operating costs of maintaining	\$15,000	\$20,000
Office equipment costs	\$10,000	\$5,000
Accounting, legal, incorporation costs	\$5,000	\$10,000
Subtotal	\$445,000 - \$545,000	\$185,000 - \$235,000

Total	\$785,000
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MANAGEMENT PROFILE

Principals

Mr. Julian Smith, the individual who conceived the concept, has been instrumental in the design, vision and refinement of the concept. Mr. Smith is a highly motivated individual with the intellectual attitude required to move conceptualization to reality. In 1993 he was chosen by Vassar College to participate in a special program designed for "students with strong academic ability, high aspirations and unusual motivation." Vassar described him as "a superb candidate for participation in this challenging educational endeavor."

Mr. James Moore, founder, president and sole shareholder of DGM Investments Inc., comes to the team as our initial financial backer to complete the patent and initial development. His career began in Wall Street in 1968 where he was Director of Marketing and Investment Policy at various brokerage firms. He comes to the team with a vision for our future marketing and management profiles. He assisted the Company in the formation of the business plan, completion of the patent process and the development of the plan for acquisition of capital and financing.

Mr. Steven Holmbraker, along with Mr. Smith, has managed the daily operations of the “proof-of-concept” phase, *Sensatec’s* (*TireSafe’s* parent company) incorporation, and the patent process. Mr. Holmbraker was instrumental in obtaining the patent. He brings our team several years of diverse task management and coordination along with his ability to direct and complete tasks in a timely manor. He has most recently coordinated multiple tasks and sites for a campus networking infrastructure at Orange County Community College.

Mr. William Campbell and Arlin Bartlett, PhD, comprise the Engineering team. Their expertise and awareness of today’s ever-changing technology have provided the team with the needed “design savvy” to create an innovative and successful product. Mr. Campbell, CEO and President of Valtec Industries, has over 25 years of design and manufacturing experience. He has managed engineering design teams and products in a number of high tech companies. Professor Bartlett comes from the academic and educational side with a BS, MS and PhD (ABD) in Electrical and Electronic Engineering. He has over 20 years of Engineering consulting experience in both military and commercial product design and manufacturing. He has worked on projects with Mr. Campbell for over 15 years.

DIRECTION

TireSafe plans to build, manufacture, market, and sell our remote tire monitoring system initially for the fleet, automobile, and heavy trucking market. *TireSafe* has already proven that our system remotely measures pressure and temperature. The first prototypes worked even better than originally anticipated. The Company seeks to secure financing of \$1,000,000 for the construction of 200 to 600 systems for its test market phase. The Company is currently working with several large trucking companies that would be interested in installing 50 - 150 systems on their trucks.

Schedule of Test Market Phase to First Production

Task	Length of Time	Dates
Completion of final prototype phase	15 Weeks	12/15/2000 - 3/31-2001
Manufacture and market test 200 to 600 systems	10 - 16 Weeks	4/1/2001 - 6/15/2001
Final product modifications	4 Weeks	6/15/2001 - 7/15/2001
Ready for production		7/15/2001

Manufacturing Contacts

During the initial prototype phase, *TireSafe* will rely on a known manufacturing/machining firm to produce the initial prototype pieces and possibly mold design. Our engineering team has been working with

this firm, estimated initial price quotes and manufacturing lead-time. The high volume manufacturer interested in meeting our needs would assure us a finished product including packaging at a low cost.

Execution

We initially selected the trucking industry because we feel they are the most rigorous test bed and, if our product is successful, our startup should be well positioned. Tractor-trailer operators will likely purchase 16-20 sensors (14-18 plus 2 spares) compared to just five (4 plus a spare) for automobiles. Obviously, the potential for a “fleet” sale is extremely attractive and the larger bulk purchase will generate a more efficient start-up sales effort. Additionally, the trucking industry does not require the same level of esthetics for its equipment, so we will have time to create a more esthetically attractive packaging for the personal automobile market. We plan to retain several individuals to fill critical roles in marketing, business management, legal services, accounting, and sales.

RATIONAL FOR SUCCESS

The public has under-estimated the effect of improper tire maintenance. While visual inspections may have previously been routine maintenance for many fleet owners in the past, they are largely ineffective. *TireSafe* technology is far more efficient and effective. Today, the transportation industry views tire pressure with increased importance as it relates to vehicle reliability, operating costs, equipment replacement, safety and the environment. Additionally, any review of how to conserve fuel starts with proper tire inflation.

Two companies, Smartire (passenger automobile models used with Goodyear’s Run Flat tires and Bridgestone’s Zero Pressure tires), and Fleet Specialties, are leading the remote tire pressure monitoring market. However they have not appreciably penetrated the private or Class 8 market primarily because of the limitations of their products. *TireSafe’s* system is easily purchased over-the-counter and installed by the vehicle operator. *Tire Safe’s* system will help trucking companies operate more safely, more economically, and with less downtime, allowing drivers and shipments to reach time-critical destinations promptly.

Corporate customers can clearly expect an excellent economic and psychological return on their investment by employing *TireSafe’s* remote tire monitoring system that promotes customer “peace of mind” regarding tire blow-outs or an impending flat tire. At *TireSafe*, we believe that our product will quickly gain market acceptance as fleet operators and individuals become aware that their profits will increase, or even that their losses will decrease by using the quality-minded *TireSafe* tire monitoring system.

Risks

Aside from the possibility that the road tests do not meet expectations, *TireSafe* faces the risks of under-capitalization, compromised trade secrets, and market overloading by a large corporation. While Smartire is an established company with a several-year history in tire measurements, we cannot rule out the potential of their resources. The economic risks affecting *TireSafe* are ineffective pricing, small cash flows, and inventory imbalances.

SUMMARY

While several products are either underdevelopment or have recently entered the marketplace, most require each sensor to be internally mounted inside of tires. Internally-mounted sensors are costly to install, repair, maintain and lack portability. *TireSafe's* combination of features, along with its ease of installation and use, sets it apart from our competitors. Our patent pending system is unique in that it is the only system that combines actual numerical pressure and temperature measurements, microprocessor-controlled sensors, and two-way communication to the dash unit on a one-piece miniature assembly that installs as a replacement cap on the valve stem. Additionally, the sensors are designed to fit most valve stem arrangements. *TireSafe* incorporates several other features that are not collectively included in any other system. These include weight (tare) measurements (in currently under development), choice of user-programmable thresholds of pressure or default settings, cold measurements (vehicle does not have to be moving), and a portable dash unit that can be used to monitor tire pressure during the filling of the tire.

TireSafe believes that our Remote Tire Pressure Monitoring System's combination of features, along with its ease of installation and use, sets us apart from our competitors. The Company's methodical, focused and well thought out startup process coupled with its technological advancement will pay handsome dividends. *TireSafe* will employ these same principles as it begins to manage the growth stage in the near future.

Today, transportation companies are looking to operate more efficiently, due to increased competition and lower profit margins. *TireSafe's* system will help transportation companies operate safely, more economically, and with less downtime. This product will assist drivers to assure that shipments reach time-critical destinations promptly. Corporate customers can clearly expect an excellent economic and psychological return on their investment by employing *TireSafe's* remote tire monitoring system.

Our team is developing additional products as well. We have proven our management and design capabilities by envisioning, designing and proving our initial product design and by aggressively pursuing and obtaining the appropriate patents. We anticipate a healthy and prosperous company with many opportunities for growth from this and subsequent products.

BIOGRAPHIES OF THE TEAM

JULIAN A. SMITH, A.S. degree program, Orange County Community College, Vassar College
Exceptional Scholar Program

Julian is currently employed by the Sullivan County Sheriff's Department, Monticello, NY and is responsible for court security, safety and security of facilities and transportation programs. From 1988 –

1989 Julian worked for Insul-Sash as a sales representative. He was recognized for having one of the highest sales accounts by regional management and excelled in his ability to continually surpass franchise owners' accounts. In 1989 he became an Account Executive for Inter-Banc Financial Network in New York City. He was responsible for conversion to Electronic Draft Capture (EDC) systems for companies such as Sheraton Hotel, Unique Electronics 8th Ave., Hotel Thayer in West Point and others. In 1991 he pursued his educational path and worked part time until 1996 when he joined the Sullivan County office. His strong academic foundation and diverse background coupled with his desire to develop new products has provided us with a driving force to visions of the future.

JAMES S. MOORE, Cornell University 1965, NASD CRD # 339028, CFTC registration # 460123, NFA registration # 363

Jim is the founder, president and sole shareholder of DGM Investments Inc., Greenwood Lake, NY since it began in 1978. He began his Wall Street career in 1968 and now concentrates on DGM's investment activities including capital allocation and treasury functions. He is also the Supervising Director of Triumph Investment Fund Ltd. a private offshore "multi-manager" hedge fund which ranks among the top performing balanced multi-manager funds. Jim has held positions as Broker, Branch Manager, Trading Manager, Sales Manager and Director of Marketing and Investment Policy at various brokerage firms. In 1974, Jim became Senior Vice President, and Director of Sales & Marketing for Shearson Hayden Stone, Inc.. By 1976, Shearson's futures and options sales grew from \$6 million to almost \$70 million and by 1978, the firm ranked as the largest futures brokers in the United States with futures assets under management growing from \$20 million to \$450 million. Jim also supervised a portion of the firm's proprietary investments, corporate planning and derivative product development.

In 1984, Jim was hired as consultant to the Chairman of Merrill Lynch & Co.'s Futures Department to streamline their futures funds management and develop innovative new derivative products. He assisted in the restructure of Merrill Lynch's managed derivatives department, hired personnel, developed the business and marketing plans, and guided the development of several new products. In January 1987, he became the Managing Director of Thomson McKinnon's Futures Management Department and restructured all of their public and private futures funds. By early 1989 all of Thomson's funds ranked among the leading performing futures funds in the industry. In March 1988, Jim developed the first "floor trading" fund, which was also the first futures offering to benefit from exchange membership - a concept that remains unique to DGM's products today. Many of the funds designed by Jim rank among the top performing funds in their respective industry sectors.

Jim has been instrumental in providing the team with financial and marketing guidance. His extensive investment experience, technological understanding, and sharp understanding in achieving goals has helped *TireSafe* gain interest in our venture and raise capital.

STEVE HOLMBRAKER, B.S. in Electrical Engineering Technology, University of Maine, 1991.

Steve is currently employed at Orange County Community College in Middletown, NY where for the last 3 years he has been a campus project manager in the Technical Services Department. He has managed the 3,000 node networking project, a three-site distance learning network, and a new campus television studio. His projects involved drafting and design, specifying bid requests, components management and supervising, and assuring regulatory compliance. He also held the position of Network and Electronic Repair Specialist for 9 years. He currently serves on the College Planning Committee. Previously Steve worked as a Station Engineer at WVII-TV in Bangor, Maine and before that as an Electronic Technician at Macbeth Corporation in Newburgh NY. Steve served in the US Army and was a Survey Party Chief for four years. His extensive engineering experience coupled with his varied management assignments provides us with a task oriented attitude that has served the team well in the timely completion of our initial prototyping, design and patent processing.

ARLIN J. BARTLETT, B.S. Electronic and Computer Engineering, Clarkson College, M.S. Engineering Science, Clarkson College, PHD (ABD) Electrical Engineering, SUNY Binghamton.

Arlin is currently employed by Orange County Community College, Middletown, NY and is Professor and Chair of the Engineering Technology Department. He has been with the College since 1976. Besides his strong academic background Arlin has been an active Engineering Consultant for 20 years. From 1980-1983 he was a private independent consultant and managed four engineering accounts. From 1983-1988 he worked as an Engineering Consultant for Macbeth Corporation, Newburgh, NY in the advanced product development branch. From 1988-1999 he was full time Temporary Manager of the Electrical Engineering Department for Cyberchron Corp. in Cold Spring, NY. He remained with the Company from 1989-1990 as a Design Consultant. Responsibilities at Cyberchron included all aspects of product design and manufacturing and engineering management. Projects included both Military and Commercial designs with one major 39 million dollar project with Jet Propulsion Labs (JPL) in California. From 1992 to present he has been an Engineering design consultant for Valtec Industries in Newburgh, NY. Most recently he was hired as a Bio-Med Specialist at Horton Medical Center to provide Y2K assistance in the Bio-Med Engineering department. His varied industrial experience and university background has provided the team with state of the art design innovation and techniques.

William A. Campbell III, A.A.S. degree program, Orange County Community College

Bill is currently CEO and President of Valtec Industries in Newburgh, NY. Valtec Industries was incorporated in 1989 and has been a successful Engineering Design firm ever since. Valtec has recently moved into advanced computer network design and management. Valtec has provided engineering design and production for commercial, military, consumer and high level research activities since its inception. Bill first worked for Macbeth Corporation in Newburgh, NY as a Senior Design Engineer in Advanced product development. From 1987 – 1990 he was Senior Design Engineer at Cyberchron Corporation in Cold Spring, NY. From 1990 – 1993 Bill was the Electrical Engineering Department Manager at Cyberchron. In 1993 he took the position of Engineering Manager at S&K Products International in Chestnut Ridge, NY, until 1994 when Valtec became a full time operation. His diverse design and manufacturing experience

span more than 20 years of producing quality cutting edge products. His design and Engineering Management background have been an asset to our prototype production planning.

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